RENE UMEH

E-mail: dubemrene@gmail.com

EDUCATION

03/2020 – 08/2024 **Hanyang University | Bachelor of Mechanical Engineering** *(Seoul, South Korea)*

- GPA: 4.01/4.5
- Awards and Scholarships: Hanyang International Excellence Award (2020,2021,2022), Global Korean Scholarship (2020), Samsung Global Hope Scholarship (2021~2024).
- Activities: Hanyang Debate Society, Hanyang RACE club (life size EV manufacturing club).

01/2022 – 05/2022 **University of Texas at Austin| International Exchange Program** *(Texas, USA)*

- GPA: 4.0/4.0

01/2018 – 05/2020 **Hanyang Institute of International Education| Korean Language Program** *(Seoul, South Korea)*

- Grades: Speaking – 96/100, Writing – 98/100, Reading – 97/100, Listening – 96/100.
- Awards and Scholarships: Outstanding Performance Scholarship.

09/2015 – 09/2018 **St. Gregory's College| High School Education** *(Lagos, Nigeria)*

- Awards and Scholarships: High School Valedictorian, Helmbridge National Science Competition – First Place.

WORK EXPERIENCE

09/2023 – Present **Hanyang University with SPACEMAP| Research Assistant** *(Seoul, South Korea)*

Key Responsibilities

- Worked on the team tasked with visualizing 25,000+ RSOs, and collision avoidance strategies generated by a 3D Voronoi diagram.
- Designed and deployed a chatbot and custom GPT using company API, accounting for ~20% of API calls.
- Worked on the company's front-end development team. Managed LinkedIn and increased content impressions by 2000%.

06/2023 – 08/2023 **Korean Institute of Science and Technology (KIST)| Intern** *(Seoul, South Korea)*

Key Responsibilities

- Created a database of 200 3D modelled and rendered characters for training a 3D reconstruction model based on PiFU.
- Created an application that allowed animations to be embedded into furniture, enabling collision-conscious automated character interaction with furniture.

06/2022 – 08/2022 **Rice University with Lavner Education| IT Intern** *(Houston, USA)*

Key Responsibilities

- Maintaining database for students, fee payments, and registrations. Processing paperwork and responding to user requests.
- Taught and designed separate lesson plans for middle to high school students on various courses weekly. Adapted classes according to age and skill level to teach IT concepts like programming languages (Java, C++), git control, 3D printing, graphic design, CAD.

12/2020 – 02/2021 **OHP Finishings Ltd. | AI Intern** *(Lagos, Nigeria)*

Key Responsibilities

- Designed and finetuned a segmentation model to demo wallpaper designs on walls in pictures.
- Managed correspondence between the firm and Korean trading partners which involved translating between English and Korean.

EXTRACURRICULAR & VOLUNTEERING ACTIVITIES

09/2022 – 09/2023 **Samsung Foundation Scholars' Council | President** *(Seoul, South Korea)*

- Organized student outreach and networking programs, and planned funding for the union's yearly budget; prepared financial reports.

11/2020 – 06/2023 **Hanyang RACE club| Mechanical Part Design Team** *(Seoul, South Korea)*

- Designed, developed, and tested parts for formula racing car projects. Optimized chassis, truss and suspension systems using Catia.

SKILLS & PERSONAL DEVELOPMENT

- Programming Languages and Frameworks: Python, C++, MATLAB, JavaScript, CSS, HTML, Typescript.
- Engineering CADs: SOLIDWORKS, AutoCAD, Catia, Ansys.
- Spoken Languages: English (Native Speaker), Korean (Fluent).

RENE UMEH

Hanyang University

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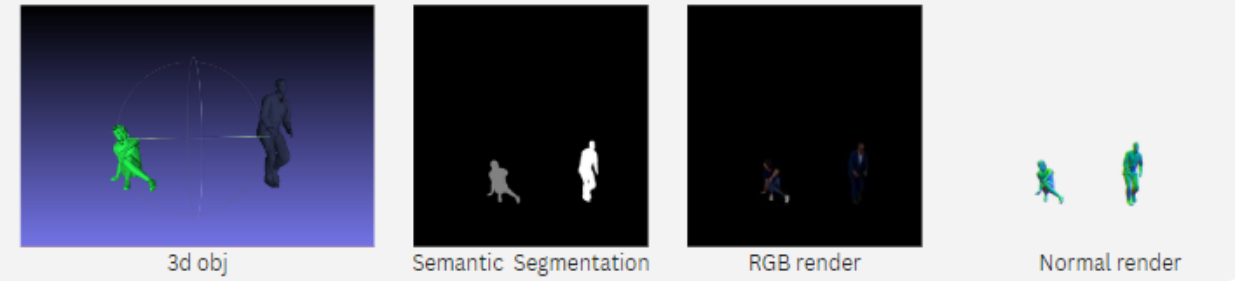
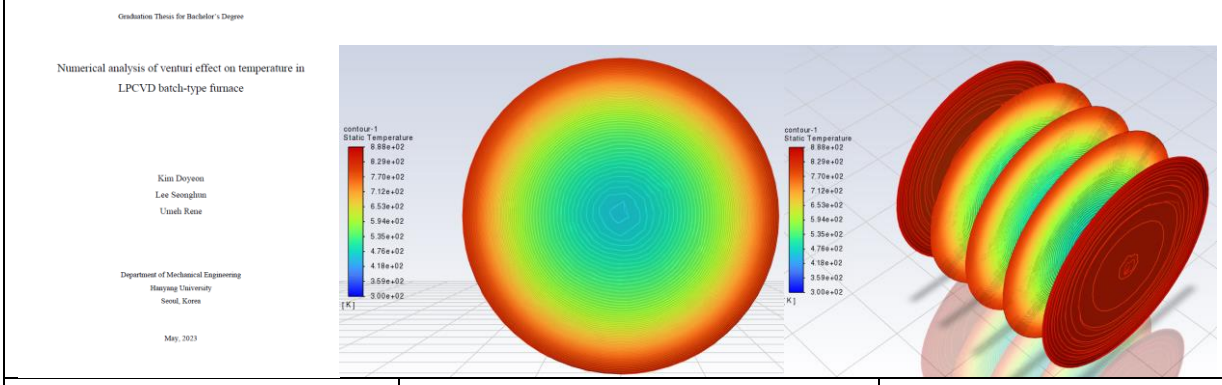
CONFIDENTIAL – Korean Institute of Science & Technology



Goal	Process	Result
• Create and train a model capable of generating 3d representations of 2d instances, based on PiFu infrastructure.	• Created a synthetic 3D dataset using **NVIDIA Omniverse** for training model including RGB, normal, and depth renders, and joint information of human characters, with specific focus on break dancing scenes and scenes containing furniture.	• Created a dataset of 200 unique scenes containing characters and furniture and trained 3D prediction model.

Bachelor's Degree Graduation Thesis – Hanyang University



Graduation Thesis for Bachelor's Degree

Numerical analysis of venturi effect on temperature in LPCVD batch-type furnace

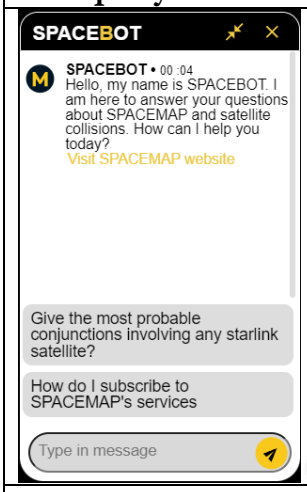
Kim Doyeon
Lee Seonghun
Umeh Rene

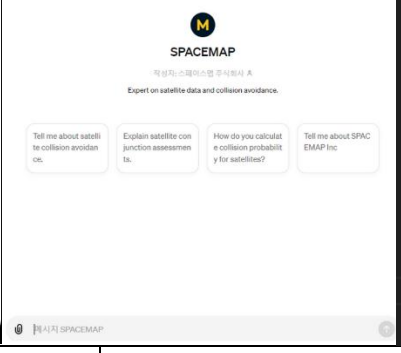
Department of Mechanical Engineering
Hanyang University
Seoul, Korea

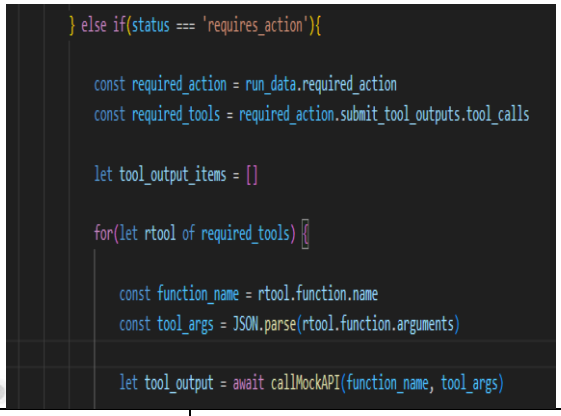
May, 2023

Goal	Process	Result
• Numerical Analysis of the Venturi Effect on the temperature in a LPCVD (Low Pressure Chemical Vapor Deposition) batch-type furnace. [Increase the uniformity of silicon wafers]	• Performed calculations to determine the estimated effect of changing the geometry of the reactor. Performed simulations using **ANSYS Fluent** to corroborate calculation results. Calculated the effect of temperature change on deposition uniformity using **MATLAB**.	• Determined the effect of the temperature distribution on the thickness of the oxide layer on the wafers were performed. Obtained the optimum radius for this geometry of the reactor.

Company Chatbot & OpenAI Integration – SPACEMAP Inc

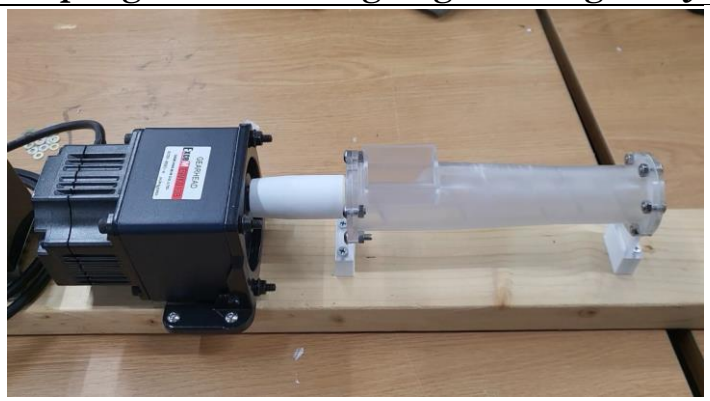


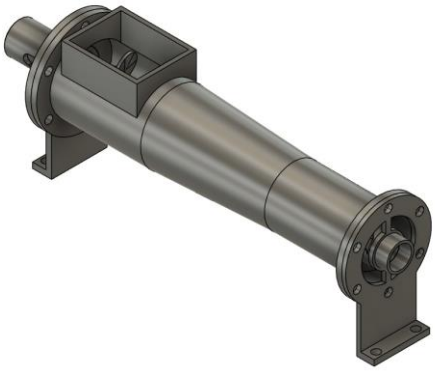




Goal	Process	Result
• Create a chatbot interface and a custom GPT using OpenAI's services and the company's APIs	• Created a backend endpoint to handle message input, OpenAI API calls, Company API calls and output using **Next js.** • Designed and created frontend UI/UX for chatbot using **React** • Created custom GPT using company APIs	• Successfully created and deployed chatbot and custom GPT, accounting for 20% of all API calls.

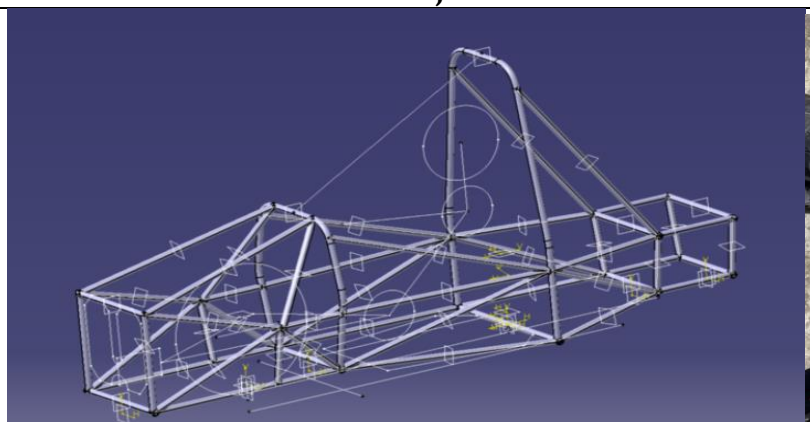
Dumpling Screw Redesigning Challenge – CJ Foods





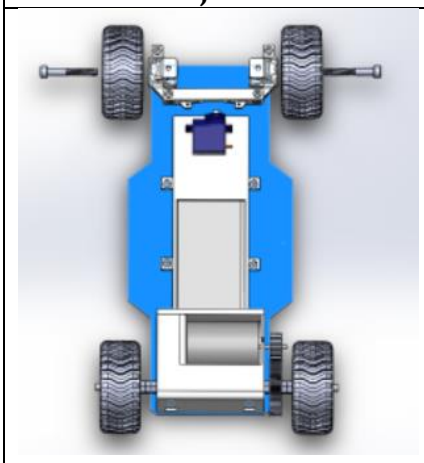
Goal	Process	Result
• Redesign the screw used for kneading and conveying dumpling dough.	• Created design considerations for screw (modularity, speed, retention of food particles, high shear rate zones) • Made design adjustments and calculated the estimated effect of design adjustments. • Performed simulations on **ANSYS Fluent** and miniature model to corroborate calculation results	• Adjusted flight angle, clearance & screw pitch to reduce retentions of food particles and increase regions of high shear rate. • Created a more modular and easier to maintain design for the screw

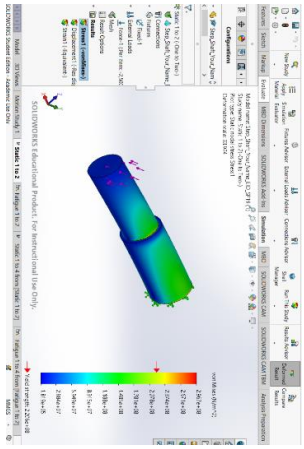
Race car Truss Structure Project – Race Club

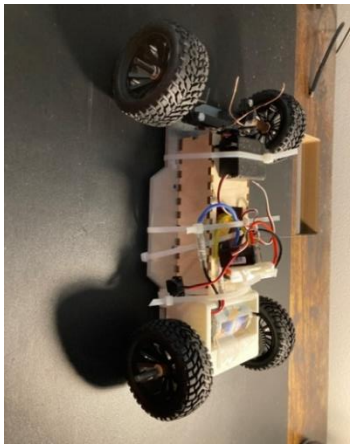


Goal	Process	Result
• Analyze the previous truss structure of the car and propose a better truss structure to increase structural rigidity.	• Used **Catia** to analyze the structural stiffness of truss structure and load. • Cut and welded pipes in the workshop.	• Increased structural rigidity by 9%.

RC Car Project – Machine Elements Course

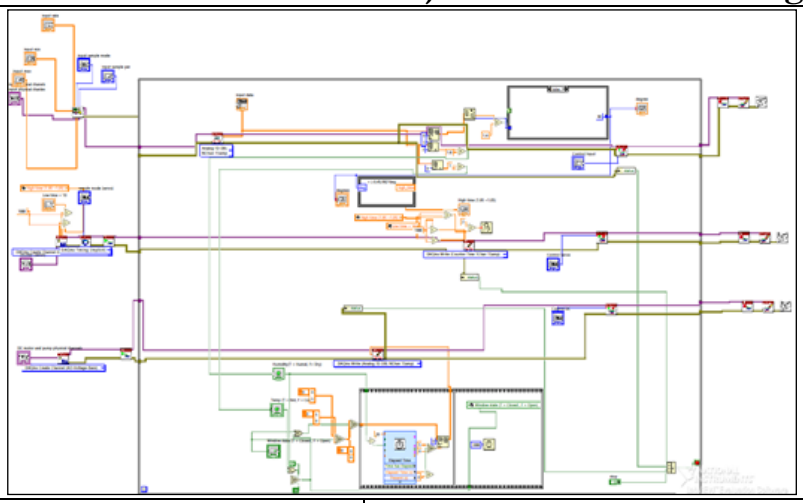


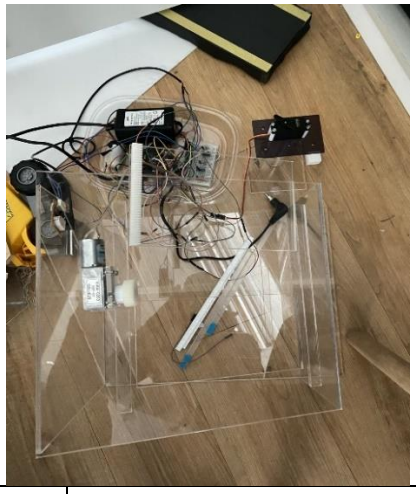




Goal	Process	Result
• Build an RC car with $50 budget. • Design the RC car to be dynamically safe while optimizing speed.	• Designed and analyzed chassis and axle, steering, drivetrain, and joints using **SOLIDWORKS**. • 3D printed or ordered parts from suppliers.	• Designed the car to withstand collisions at a maximum speed of 10 m/s. • Placed third place in the driving competition.

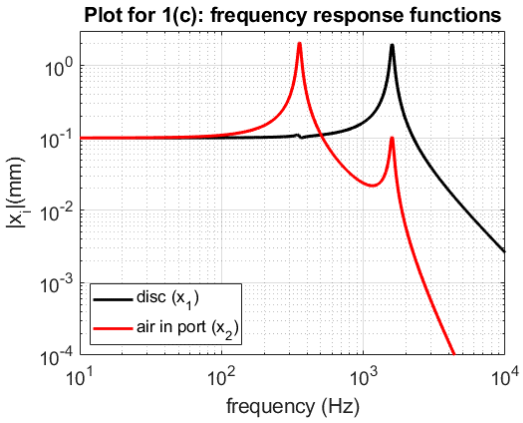
Automatic Greenhouse Project – Mechanical Design & Experiments Course

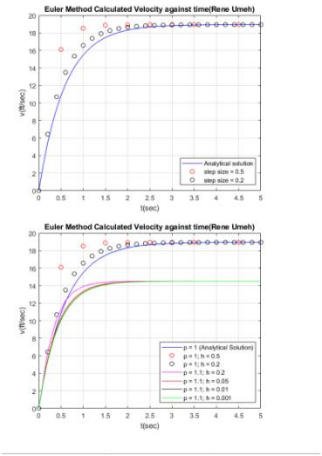




Goal	Process	Result
• Create a model for an automated greenhouse with a budget of 100,000 won.	• Used **LABVIEW** to create a program that processes light, humidity, and temperature signals from sensors. • Purchased motors, breadboards, sensors, and acrylics from suppliers.	• Completed the working model within the allotted time and budget.

Vibrating Disk Analysis Experiment – Machinal Vibrations Course





Goal	Process	Result
• Create a computer simulation of a vibrating disc and compare the results to a real experiment.	• Used **MATLAB** to create a code that calculates the disk's natural frequency, time, and frequency response.	• Achieved an error of 13% when compared to actual experiment.